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Attn. Mr. Richard J. Berman

Re: 1° O.A. (FINAL)  
U.S. Patent Appln. S.N. 10/619,190  
By: COLAIANNA et al.  
Your Ref: 108910-00110  
Our Ref.: AF 2636CONT/031/USA

Dear Sirs,

Further to your letter in Re dated June 30, 2005, our comments are as follows.

AMENDMENT IN CLAIM 1.

Please, amend claim 1 by adding the chain transfer agent and other features, as follows:

1. Melt processable copolymers at extrusion rate higher than 800 m/minute, formed by TFE and FMVE, having Melt Flow Index (MFI) (ASTM D 1238) from 8 g/10 min to 50 g/10 min obtainable by using in the polymerization step a chain transfer agent in an amount so to obtain the above MFI, having mechanical properties unchanged after thermal aging for 7 days at 232°C.  
said copolymers having the following composition:
  - FMVE in per cent by moles from 3.7% to 5.2%;  
the percent TFE moles being the complement to 100% of the FMVE moles.

Support for the above amendment is in the Spec, in particular:

- melt processability at high extrusion rate is supported in the Spec, page 6, lines 7-9, where also the absence of melt-fracture is specified;
- chain transfer agents are supported at page 7 lines 4-8; besides, all Examples of the invention and Comparative Examples of the Declaration thereafter enclosed use ethane as chain transfer agent;
- maintenance of mechanical properties after thermal aging for 7 days at 232°C, according to the UL 444 standard, is supported in the Spec, page 6, lines 13-14, and page 11, lines 5-7.

The Examiner, at page 5, point 9. of the O.A. states that the key point is that all the properties recited by the Applicants and read into the specification are not read into claim 1 as limitations. Moreover, the Examiner also states that he cannot and would not read the specification into the claim 1.

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Besides, at the end of page 6, point 10 of the O.A. the Examiner again underlines that claim 1 does not contain as limitations the superior properties of the claimed copolymer in comparison with that of Pucciariello.

Therefore, to overcome the above Examiner's objections for lacking in claim 1 of limitations which are in the Spec, we have included them in the new claim 1, as requested by the Examiner. No new matter is added.

Novelty over Pucciariello (J.A.P.S., Vol.64, 407-409 (1997))

The Examiner, at page 5, point 9 of the O.A., recognizes that Pucciariello's copolymer may have a lower MFI since chain transfer is not used or suggested.

Therefore, new amended claim 1, with the additional limitations concerning chain transfer agent and superior properties as requested by the Examiner should overcome the novelty rejection over Pucciariello.

Actually, MFI, as well as the use of chain transfer agents are two features characterizing the presently claimed copolymer which clearly distinguish it from the Pucciariello's copolymers where chain transfer agents are absent, as the Examiner recognizes.

Indeed, in view of the Declaration hereinafter described it appears evident that the copolymer of the reference prepared in the absence of chain transfer clearly results in a MFI too low, far from the presently claimed copolymer, and not satisfactory for the purpose of the present invention (fluorinated polymer for LAN cables having improved extrusion rate combined with improved electric insulation, also after thermal aging according to UL 444 standard).

Likewise, melt processability and maintenance of mechanical properties after thermal aging for 7 days at 232°C are also features characterizing the claimed product, distinguishing from that of Pucciariello, which is silent about the melt processability of his TFE-copolymers with 2-10% of FMVE. Indeed, Pucciariello teaches only thermal analysis performed on his copolymers, which does not teach anything about melt processability; as stated in your previous letter to USPTO dated

March 14, 2005, page 5, lines 12-15, the melt temperature of a polymer (e.g. PTFE) does not means that it is also melt processable (e.g. PTFE is not melt processable due to its very very high melt viscosity).

DECLARATION.

In order to show the essential role of MFI in the fluorinated polymer usable for LAN cables preparation having improved extrusion rate combined with improved electric insulation, applicants submit the hereinafter enclosed Declaration containing two Comparative Examples A and B, with MFI lower and higher than the claimed range 8-50 g/min.

Both copolymers A and B are obtained with the same equipment and method as copolymers of Examples 1, 3, 4 and 7 of the specification, except for the amount of chain transfer agent ethane, which was used in an amount so to obtain a MFI = 6 g/10 min in copolymer A and MFI = 55 g/10 min in copolymer B.

Table A shows that the MFI = 6 of copolymer A (i.e. lower than the claimed limit of 8) gives a wire speed of only 300 m/min. This means that at values of wire speed higher than 300 flow instability occurs (oscillations, cone cracks, etc.). Said 300 m/min of wire speed appears clearly lower than 900 m/min obtained by the copolymers of the invention (see Examples 1, 3, 4 and 7 of the Spec), out of the claimed limit 800 m/min.

Besides, the MFI = 55 of copolymer B (i.e. higher than the claimed limit of 50) monitored by a spark tester, showed 5 spark failures/14 km.

Said 5 spark failures occur in correspondence of defects in the insulating sheath, and appear clearly higher than 2 spark failures obtained by the copolymers of the invention.

The above evidence demonstrates that MFI actually is a key parameter for solving the technical problem of this application in combination with the claimed polymer composition containing FMVE in the range 3.7-5.2 molar %.

We note that Comparative Example A, though it comprises low amount of chain transfer agent ethane, however results in an unsatisfactory melt processability, since it reaches a wire speed of only 300 m/min (lower than the 800 m/min of claim 1,

which is the lowest wire speed acceptable, according to claim 1).

Therefore, it is evident that the Pucciariello's copolymer, which does not contain any chain transfer agent, will show an even more unsatisfactory melt processability not suitable for solving the following technical problem of the present invention:

to find a fluorinated polymer usable for LAN cables preparation by melt extrusion at an improved extrusion rate higher than 800 m/minute, combined with improved electric insulation (see spark failure/14 km = 2 in Examples 1, 3, 4 and 7), and stable mechanical properties after thermal aging.

Non obviousness over Pucciariello.

Comparative Examples A and B of the Declaration clearly prove that the above technical problem can be solved only by the copolymers as defined in claim 1, in particular, having MFI between 8 and 50 g/10 min combined with a FMVE content between 3.7 and 5.2% by moles, and showing the maintenance of mechanical properties after thermal aging for 7 days at 232°C, according to the UL 444 standard.

The Examiner states that it would be obvious to use chain transfer into Pucciariello's copolymers, since they are commonly used in the art to control the molecular weight of the polymer.

However, a skilled in the art, having to solve the technical problem of the present invention, does not find in the cited prior art any slight suggestion that only the copolymers having the claimed combination of composition (3.7-5.2 % by moles) and MFI (8-50 g/10 min) can solve the present technical problem.

We point out that Pucciariello teaches DSC analysis on TFE/FMVE copolymers having in particular also 2 mol % of FMVE, while comparative Example 2 of the present application shows that copolymers having 2% FMVE do not solve the present technical problem (see also Spec, page 8, lines 13-22).

According to the present invention only the TFE/FMVE copolymers having simultaneously either the FMVE composition 3.7-5.2% and MFI between 8 and 50 g/10 min is usable for LAN cable. Therefore, the present invention is not only novel, but also not obvious over Pucciariello.

Inventive step over Pucciariello in view of Abusleme.

The Examiner states again that the use-claims 3-5 concerning the use for LAN electrical cables has not inventive step since Pucciariello and Abusleme teaches similar copolymers comprising TFE and FMVE dipolymers, and Abusleme teaches the use for LAN electrical cables.

According to the Examiner, the worst result obtained by comparative Example 4 of Abusleme may be due to a different process or from additives.

We note, instead, that according to Table 1 at col. 7 of Abusleme the MFI of the dipolymer is 7 g/10 min and the composition is 4.6% by weight corresponding to 2.8% by moles of FMVE. Therefore, Abusleme's comparative Example 4 is outside the claimed range of either composition and MFI.

Therefore, Abusleme teaches away from the present invention because he teaches that terpolymers must be used, not copolymers TFE/FMVE for preparing LAN cables.

The Examiner can sustain the obviousness rejection over Pucciariello in view of Abusleme only by using a n ex post facto analysis that cannot be used for evaluating obviousness. As a matter of fact, the Examiner was not able to cite a single passage of Abusleme capable to fill the gap of Pucciariello. Indeed, there nothing either in Pucciariello or in Abusleme suggesting to the skilled in the art the claimed solution. Therefore, also claims 3-5 which use copolymers of claim 1 are novel and non obvious over Pucciariello in view of Abusleme.

Therefore, the Notice of Allowance is expected.

Very truly yours,

SAMA PATENTS

Daniele Sama



Encl. Declaration

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